In the claims:

1. (Currently amended) A network comprising:

> a plurality of optical core nodes, each having an optical switch fabric including a plurality of inward ports receiving optical signals from other core nodes; and a plurality of outward ports transmitting optical signals to other core nodes; and
>
> a plurality of edge nodes each subtending to at least one of said core nodes;

wherein at least one channel connects a selected outward port of a first core node to a selected inward port of a second core node and said at least one channel is provided with a signal buffer and a buffer controller; said buffer and buffer controller associated with said selected outward port;

wherein at least one of said core nodes further includes:

> a plurality of bufferless inlet ports receiving optical signals from subtending edge nodes; and
>
> a plurality of bufferless outlet ports transmitting optical signals to subtending edge nodes;

and wherein said buffer controller has a time-locking circuit operable to exchange time-locking signals with controllers of external nodes.

2. (Cancelled)

3. (Currently amended) The network of claim [[2]] [1] wherein said buffer is associated with said selected inward port.

4. (Original) The network of claim 3 wherein said buffer controller sorts buffered signals according to the outlet ports and outward ports to which the signals are switched through the optical switch fabric of said first core node.

5. (Cancelled)

6. (Cancelled)

7. (Currently amended) The network of claim [[6]] [1] wherein said buffer controller sorts buffered signals according to the outlet ports and outward ports to which the signals are switched through the optical switch fabric of said second core node.

8. (Cancelled)

9. (Currently amended) ~~The~~ [A] network ~~of claim 8~~ comprising:

a plurality of optical core nodes, each having an optical switch fabric including a plurality of inward ports receiving optical signals from other core nodes; and a plurality of outward ports transmitting optical signals to other core nodes; and

a plurality of edge nodes each subtending to at least one of said core nodes;

wherein at least one channel connects a selected outward port of a first core node to a selected inward port of a second core node and said at least one channel is provided with a signal buffer and a buffer controller;

wherein at least one of said core nodes further includes:

a plurality of bufferless inlet ports receiving optical signals from subtending edge nodes; and

a plurality of bufferless outlet ports transmitting optical signals to subtending edge nodes;

wherein said buffer comprises an optical-to-electrical converter, an electronic memory, and an electrical-to-optical converter;

and wherein each of said core nodes has a core controller including a master time counter and a master timing circuit operable to transmit and receive timing signals.

10. (Original) The network of claim 9 wherein said master timing circuit distributes a time reference to said at least one of said inward ports.

11. (Original) The network of claim 10 wherein at least one of said edge nodes is time-locked to at least one of said core nodes.

12. (Original) The network of claim 11 wherein said core controller is adapted to receive connection requests from, and transmit connection schedules to, subtending edge nodes.

13. (Original) The network of claim 12 wherein said core controller further includes a scheduling mechanism for computing said connection schedules.

14. (Original) The network of claim 13 wherein said connection requests include time-slot allocations in a time-division-multiplexed frame.

15. (Original) The network of claim 13 wherein said connection requests include burst-transfer requests.

16. (Original) The network of claim 13 wherein said core controller is operable to receive flow-rate-allocation requests and schedule a corresponding number of time slots per time-division-multiplexed frame.

17. (Original) The network of claim 13 wherein said core controller is operable to receive flow-rate-allocation requests and compute corresponding burst-transfer permits.

18. (Original) The network of claim 17 wherein said core controller is further operable to receive burst-transfer requests and compute corresponding burst-transfer schedules.

19. (Original) The network of claim 18 wherein said core controller of a core node is further operable to allocate an entire channel from the core node to a selected edge node subtending to another of said core nodes.

20. (Original) A network comprising:

a plurality of edge nodes; and

a plurality of optical core nodes, at least one of said core nodes having:

an optical switch fabric; and

a core controller;

wherein at least one of said edge nodes is time-locked to said at least one of said core nodes;

and wherein said core controller is operable to:

receive requests for transfer of time-limited signals from said at least one of said edge nodes;

compute a transfer schedule for said time-limited signals; and

allocate a continuous path from said at least one of said core nodes to carry time-limited signals destined to a plurality of edge nodes subtending to another of said core nodes.

21. (Original) The network of claim 20 wherein said time-limited signal is an optical signal carrying at least one time slot belonging to a time-division-multiplexed frame.

22. (Original) The network of claim 20 wherein said time-limited signal is an optical signal carrying a data burst of an arbitrary size.

23. (Original) The network of claim 20 wherein said continuous path terminates in a selected edge node from among said plurality of edge nodes and said selected edge node transmits time-limited signals to other edge nodes through said another of said core nodes.

24. (Withdrawn) In a network comprising edge nodes and core nodes, a method of setting up a path from a first edge node to a second edge node, the method comprising steps of:

time-locking said first edge node to a first core node;

allocating a first time-interval in a first wavelength channel from said first edge node to said first core node and in a second wavelength channel from said first core node to a second core node;

allocating a second time-interval in a third wavelength channel from said second core node to said second edge node; and

time-switching said first time-interval to said second time interval at a decoupling buffer placed along said second wavelength channel.

25. (Withdrawn) A method of setting up a path from a first edge node to a second edge node, the method comprising steps of

time-locking said first edge node to a first core node;

allocating a first time-interval in a first wavelength channel from said first edge node to said first core node;

allocating a second time-interval in a second wavelength channel from said first core node to said second core node and in a third wavelength channel from said second core node to said second edge node;

time-locking a decoupling buffer, placed along said second wavelength channel, to said second core node; and

time-switching said first time-interval to said second time interval at said decoupling buffer.

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Withdrawn) In a network comprising edge nodes and core nodes, a method of time-locking a path originating from a selected edge node and traversing a first core node towards a second core node, the method comprising steps of:

setting a first time-locked path from said selected edge node to said first core node;

sending a request, through said first time-locked path, to a controller of said first core node to establish an exclusive path through said first core node towards said second core node; and

setting a second time-locked path from said selected edge node to said second core node along said exclusive path.

31. (Withdrawn) The method of claim 30 wherein said first time-locked path traverses an upstream channel from a first outbound port of said selected edge node to an inward port of said first core node.

32. (Withdrawn) The method of claim 30 wherein said second time-locked path traverses an upstream channel from a second outbound port of said selected edge node, an internal channel through said first core node, and a core channel from an outward port of said first core node to an inward port of said second core node.

33. (Currently amended) A meshed network comprising a plurality of optical core nodes each having:

an optical switch fabric;

a plurality of inward ports receiving optical signals from other core nodes; and

a plurality of outward ports transmitting optical signals to other core nodes;

a plurality of edge nodes each subtending to at least one of said core nodes and connecting to data sources and data sinks;

wherein at least one of said core nodes further includes:

a plurality of inlet ports receiving optical signals from subtending edge nodes; and

a plurality of outlet ports transmitting optical signals to subtending edge nodes;

wherein

at least one outward port of each core node has a core channel connecting to an inward port of another core node; and

at least one of said inward ports is provided with a buffer and a buffer controller for time aligning signals received at said buffer.

34. (Cancelled)

35. (Cancelled)

36. (Cancelled)

37. (Currently amended) The meshed network of claim ~~36~~ 33 wherein each of said core nodes further includes a core controller operable to communicate with core controllers of other core nodes to exchange connection-scheduling data.

38. (Currently amended) A meshed network comprising a plurality of optical core nodes each having:

an optical switch fabric;

a plurality of inward ports receiving optical signals from other core nodes; and

a plurality of outward ports transmitting optical signals to other core nodes;

a plurality of edge nodes each subtending to at least one of said core nodes and connecting to data sources and data sinks;

wherein at least one of said core nodes further includes:

a plurality of inlet ports receiving optical signals from subtending edge nodes; and

a plurality of outlet ports transmitting optical signals to subtending edge nodes;

wherein

at least one outward port of each core node has a core channel connecting to an inward port of another core node; and

at least one of said outward ports is provided with a buffer[;]

wherein said buffer is associated with a buffer controller for time locking said buffer to an external node.

39. (Cancelled)

40. (Cancelled)

41. (Cancelled)

42. (Currently amended) The meshed network of claim ~~41~~ 38 wherein each of said core nodes further includes a core controller operable to communicate with core controllers of other core nodes to exchange connection-scheduling data.